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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,595	03/12/2004	Premjit J. Daniel	GEMS 0237 PA	2594

27256 7590 02/10/2006

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EXAMINER
HO, ALLEN C

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/708,595	DANIEL ET AL.	
	Examiner	Art Unit	
	Allen C. Ho	2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *15-20* is/are allowed.

6)☒ Claim(s) *1-7,13 and 14* is/are rejected.

7)☒ Claim(s) *8-12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 5 is objected to because of the following informalities:

Line 2, "pipes" should be replaced by --conductors--.

Appropriate correction is required.

2. Claim 13 is objected to because of the following informalities:

Claim 13 recites a second x-ray shield. However, there is no first x-ray shield in claim 1.

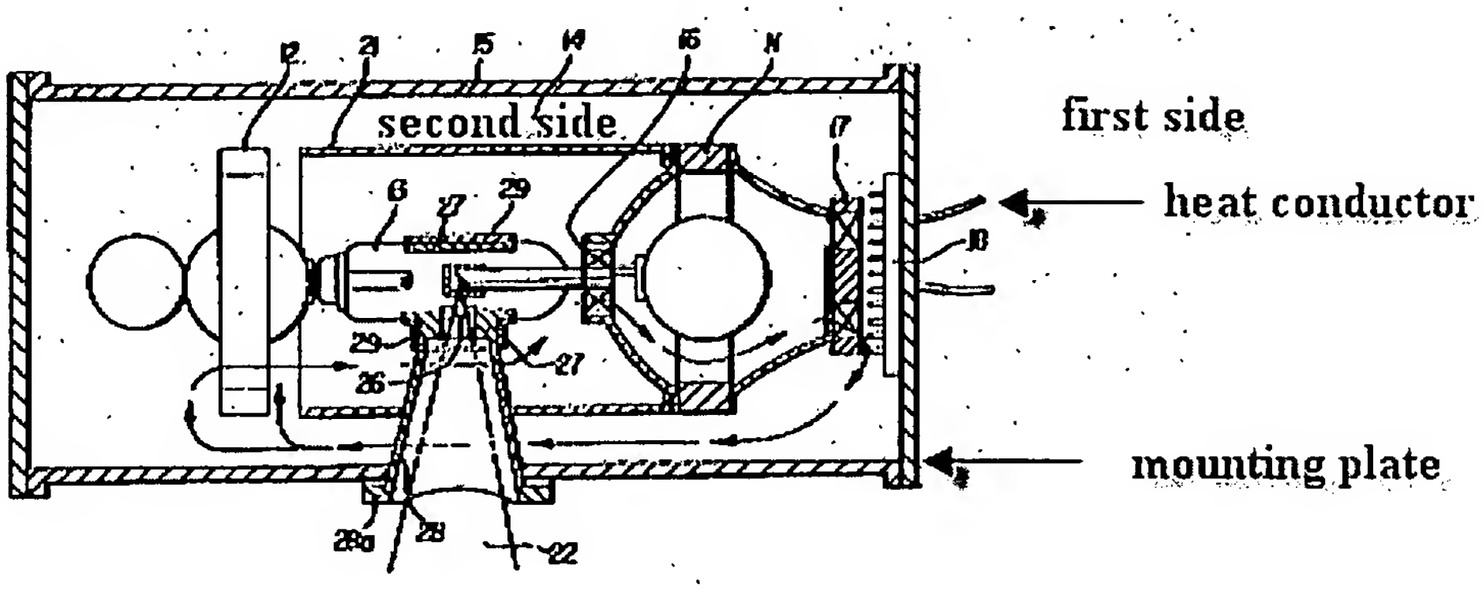
Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 3-5, 7, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Kitadate *et al.* (U. S. Patent No 4,384,360).



With regard to claim 1, Kitadate *et al.* disclosed a cooling system for an imaging system comprising: a mounting plate comprising a first side and an opposing second side, the mounting plate further defining at least one opening; at least one heat conductor (**18**) extending through the at least one opening and through at least a portion of a dielectric fluid reservoir (**14**) defined adjacent the second side of the mounting plate and enclosing an x-ray source (**13**); the at least one heat conductor absorbing heat from the dielectric fluid while not permitting the dielectric fluid to flow therein; and a heat sink (an external source) coupled to the first side of the mounting plate, the heat sink receiving at least a portion of the at least one heat conductor (column 3, lines 17-19).

With regard to claim 3, Kitadate *et al.* disclosed the system of claim 1, further comprising a second heat conductor (the other heat conductor) spaced apart from the first heat conductor and extending through a second opening defined in the mounting plate.

With regard to claim 4, Kitadate *et al.* disclosed the system of claim 1, further comprising a plurality of spaced apart openings in the mounting plate arranged in an arc (the two openings can be fit to an arc).

With regard to claim 5, Kitadate *et al.* disclosed the system of claim 1, further comprising a plurality of heat conductors extending through the plurality of spaced apart opening.

With regard to claim 7, Kitadate *et al.* disclosed the system of claim 1, further comprising a thermally conductive sleeve (**21**) coupled to the at least one heat conductor, the thermally conductive sleeve at least partially surrounding the x-ray source.

With regard to claim 13, Kitadate *et al.* disclosed the system of claim 1, further comprising a second x-ray shield (**25**) coupled to the heat sink.

5. Claims 1, 2, 6, 7, 13, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Radley *et al.* (U. S. Pub. No. 2004/0218725 A1).

With regard to claim 1, Radley *et al.* disclosed a cooling system for an imaging system comprising: a mounting plate (**92**) comprising a first side and an opposing second side, the mounting plate further defining at least one opening (**94**); at least one heat conductor (**74**) extending through the at least one opening and through at least a portion of a dielectric fluid (paragraph [0058], lines 16-23) reservoir (**82**, **158**) defined adjacent the second side of the mounting plate and enclosing an x-ray source (**34'**); the at least one heat conductor absorbing heat from the dielectric fluid while not permitting the dielectric fluid to flow therein; and a heat sink (outside environment) coupled to the first side of the mounting plate, the heat sink receiving at least a portion of the at least one heat conductor.

With regard to claim 2, Radley *et al.* disclosed the system of claim 1, wherein the at least one heat conductor comprises a polygonal cross-section (Fig. 6).

With regard to claim 6, Radley *et al.* disclosed the system of claim 1, wherein the heat sink comprises a plurality of thermally conductive blocks (**74**) coupled to the first side of the mounting plate.

With regard to claim 7, Radley *et al.* disclosed the system of claim 1, further comprising a thermally conductive sleeve (**36**) coupled to the at least one heat conductor, the thermally conductive sleeve at least partially surrounding the x-ray source.

With regard to claim 13, Radley *et al.* disclosed the system of claim 1, further comprising a second x-ray shield (**90**) coupled to the heat sink.

With regard to claim 14, Radley *et al.* disclosed the system of claim 1, wherein the dielectric fluid comprises at least one of petroleum or silicone (paragraph [0054], lines 5-8).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitadate *et al.* (U. S. Patent No 4,384,360) as applied to claim 1 above.

With regard to claim 2, Kitadate *et al.* disclosed the system of claim 1. However, Kitadate *et al.* failed to teach that at least one heat conductor comprises a polygonal, semi-circular, or irregular cross-section.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a heat conductor that comprises any cross-section, since a person would be motivated to employ a heat conductor having a cross-section to convey a cooling fluid.

The shape of the cross-section is irrelevant as long as the cooling fluid is being conveyed to where it is supposed to go.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitadate *et al.* (U. S. Patent No 4,384,360) as applied to claim 1 above, and further in view of Cheon (U. S. Patent No. 6,313,990 B1).

With regard to claim 6, Kitadate *et al.* disclosed the system of claim 1. However, Kitadate *et al.* failed to teach that the heat sink comprises a plurality of thermally conductive blocks coupled to the first side of the mounting plate, or a solid thermally conductive block coupled to the first side of the mounting plate.

Cheon disclosed a heat sink (**36**) that comprises a plurality of thermally conductive blocks (**44**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a heat sink with a plurality of thermally conductive blocks, since a person would be motivated to increase the cooling capacity of a heat sink.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kitadate *et al.* (U. S. Patent No 4,384,360) as applied to claim 1 above, and further in view of Dilick (U. S. Patent No. 6,254,272 B1).

With regard to claim 14, Kitadate *et al.* disclosed the system of claim 1. However, although Kitadate *et al.* disclosed a dielectric fluid, Kitadate *et al.* failed to teach that the dielectric fluid comprises at least one of petroleum or silicone.

Dilick taught that a fluid of petroleum derivative is suitable for use as insulating fluid for an x-ray tube.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a dielectric fluid that comprises petroleum, since a person would be motivated to use a fluid that has demonstrated its applicability as an insulating fluid for an x-ray tube.

10. Claims 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Radley *et al.* (U. S. Pub. No. 2004/0218725 A1) as applied to claim 1 above.

With regard to claims 3-5, Radley *et al.* disclosed the system of claim 1. However, although Radley *et al.* disclosed a plurality of heat conductors, Radley *et al.* failed to disclose a plurality of openings in the mounting plate.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a plurality of openings in the mounting plate that corresponds to the plurality of heat conductors, since a person would be motivated to provide a seal around each heat conductor when a dielectric fluid is used (paragraph [0058], lines 16-23).

Allowable Subject Matter

11. Claims 8-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claims 15-20 are allowed.

13. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 8-12, the prior art failed to disclose a thermally conductive sleeve that defines at least one groove, the at least one heat conductor is coupled to the thermally conductive sleeve at a surface of the groove as claimed.

With regard to claims 15-19, although the prior art discloses a cooling system for an imaging system including an x-ray source comprising a mounting plate comprising a first side and an opposing second side, the mounting plate further defines a plurality of openings spaced apart from each other, a plurality of heat pipes extending through the plurality of openings, a plurality of thermally conductive fins coupled to the first side of the mounting plate, the plurality of thermally conductive fins receiving at least a portion of each of the plurality of heat pipes, it fails to teach or fairly suggest that the cooling system further comprises an x-ray shield surrounding the x-ray source, the x-ray shield comprising a first end and a second end, the first end defining a plurality of openings receiving the plurality of heat pipes, the first end spaced a distance from the second side of the mounting plate, the second end defining an opening for x-rays from the x-ray source to exit as claimed.

With regard to claim 20, although the prior art discloses a cooling system for an imaging system including an x-ray source comprising a housing defining a dielectric oil reservoir enclosing the x-ray source, a mounting plate comprising a first side and an opposing second side such that the second side defines a boundary of the dielectric oil reservoir, the mounting plate further defining a plurality of openings spaced apart from each other in an arc formation, a plurality of heat pipes extending through the plurality of openings, a plurality of thermally conductive fins arranged parallel to the first side of the mounting plate, the plurality of thermally conductive fins receiving at least a portion of each of the plurality of heat pipes, it fails to teach

or fairly suggest that the cooling system further comprises a generally arc-shaped thermally conductive sleeve at least partially surrounding the x-ray source, and an x-ray shield enclosing the generally arc-shaped thermally conductive sleeve and arranged trans-axially thereto with the housing as claimed.

Response to Arguments

14. Applicant's arguments filed 26 January 2006 with respect to the drawings have been fully considered and are persuasive. The objections of the drawings have been withdrawn.

15. Applicant's arguments filed 26 January 2006, with respect to the specification have been fully considered and are persuasive. The objections of the specification have been withdrawn.

16. Applicant's arguments filed 26 January 2006 with respect to claims 7-12 have been fully considered and are persuasive. The rejection of claims 7-12 under 35 U.S.C. 112, second paragraph, has been withdrawn.

17. Applicant's arguments filed 26 January 2006 with respect to the rejection(s) of claim(s) 1, 3-5, 7, and 13 under 35 U.S.C. 102 (b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kitadate *et al.* (U. S. Patent No 4,384,360) and Radley *et al.* (U. S. Pub. No. 2004/0218725 A1).

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Allen C. Ho

Allen C. Ho
Primary Examiner
Art Unit 2882

07 February 2006